python for Computational Problem Solving - pCPS - Dictionaries_Sets Lecture Slides - Class #19_#20

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pCPS Assignment Batches

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1,pCPS_Assignment_Batch_ID_2,"('PES1202100862', 'PES1202101351', 'PES1202100999')"
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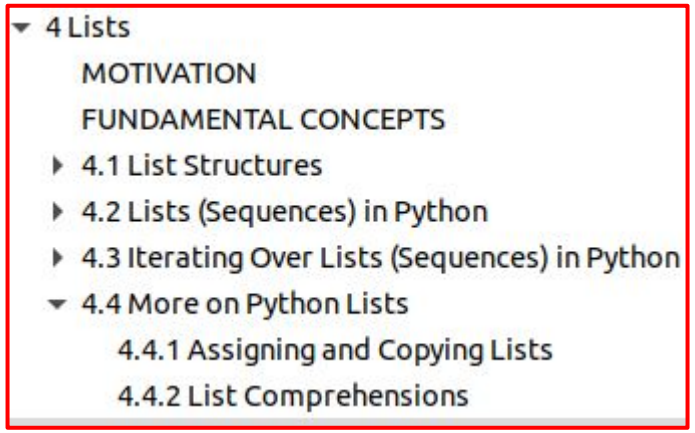
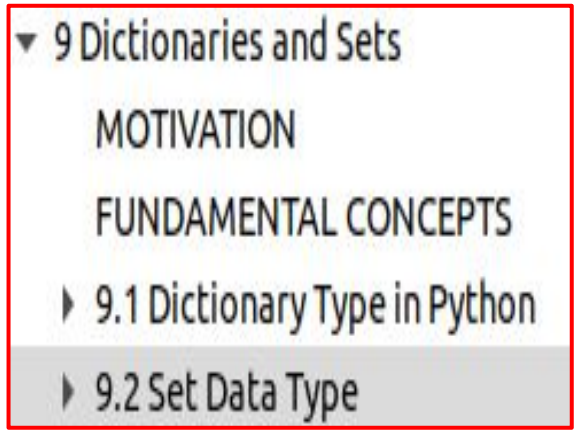
python for Computational Problem Solving Syllabus

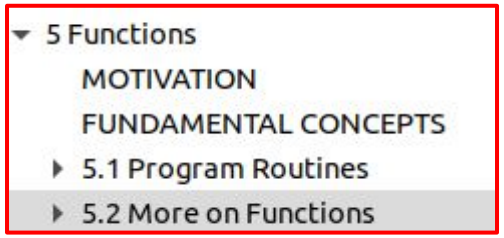
Unit II: Collections & Basics of Functions - 12 Hours

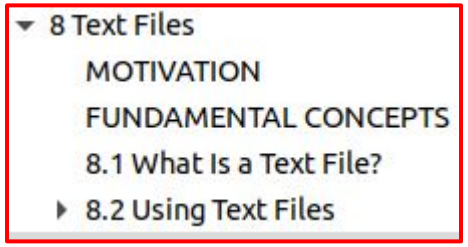
Lists, Tuples , Dictionaries, Sets, Strings and text file manipulation: reading and writing files. Functions : Definition, call.

T1: 4.1 – 4.4 - Class #15, #16, #17, #18
T1: 9.1 – 9.2 - Class #19, #20, #21, #22
T1: 5.1-5.2 - Class #23, #24
T1: 8.1, 8.2, 8.3 - Class #25, #26

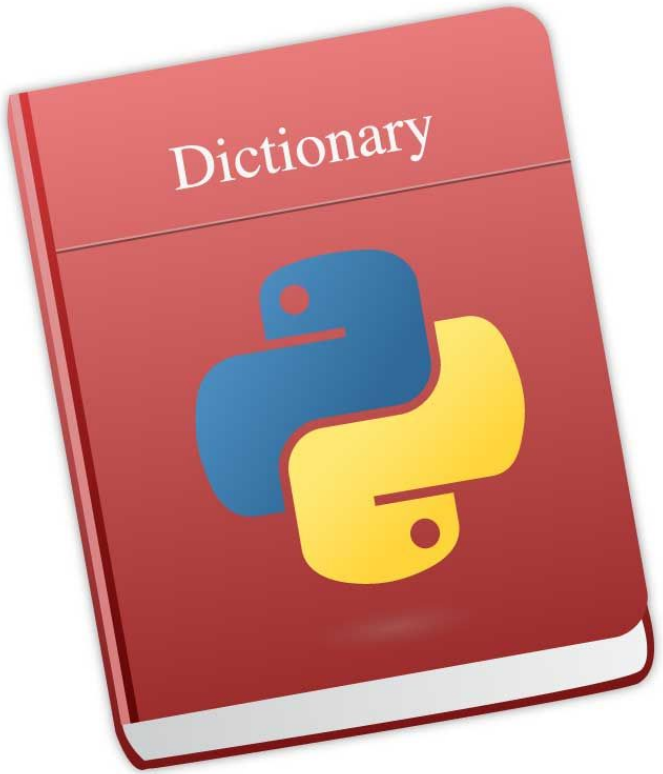








pCPS 9 python Dictionary



pCPS 9.1 Dictionary Type in python

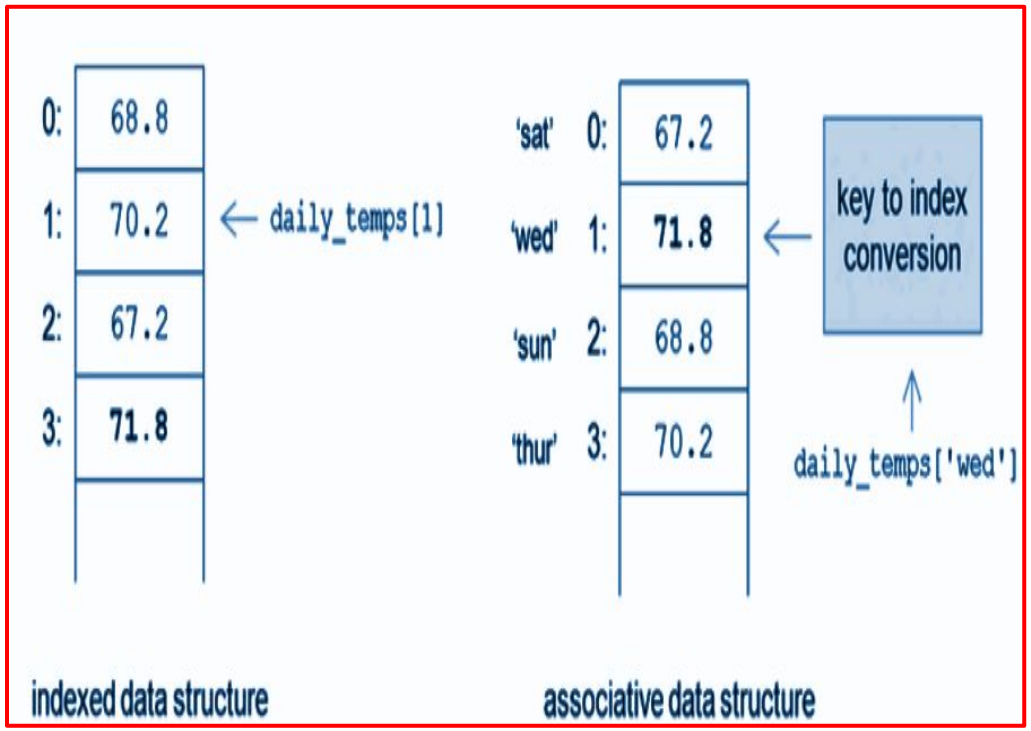
- In this topic we introduce the notion of an **associative data structure**

- The elements of an associative data structure are **unordered**, instead **accessed** by an associated **key** value

- In python, an associative data structure is provided by the **dictionary type** .

pCPS 9.1.1 Dictionary in python

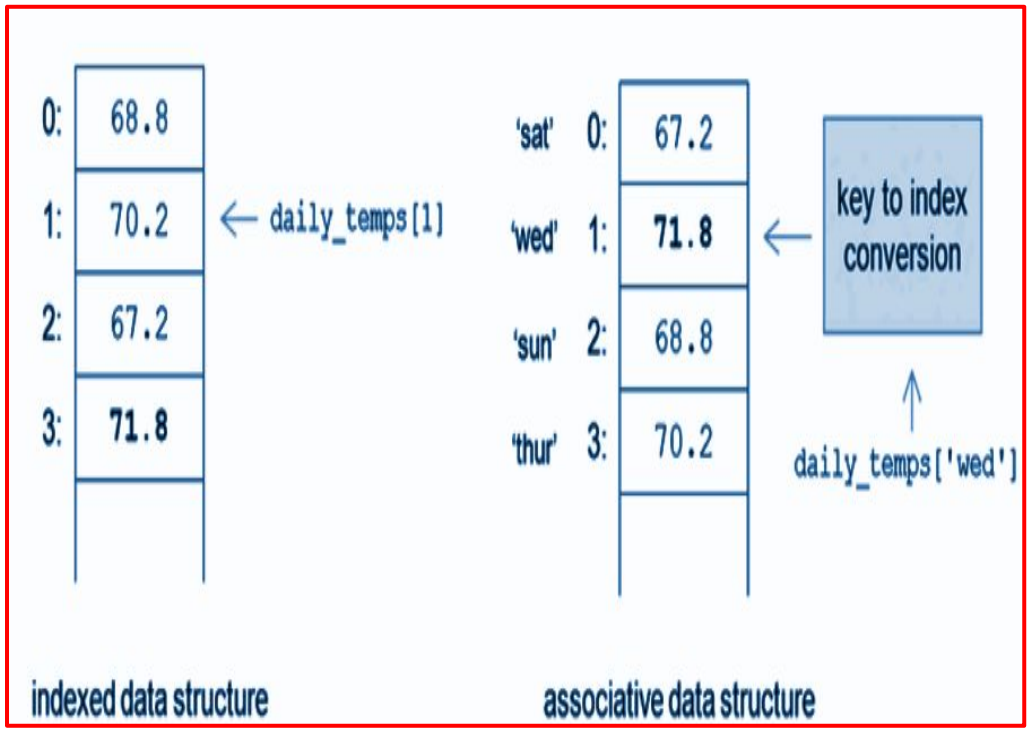
- A **dictionary** is a **mutable**, associative data structure of **variable length**.
- On the left is an indexed data structure, and on the right an associative data structure.
- **Even though** the elements of the associative data structure are **physically ordered**, the **ordering** is **irrelevant** to the **way** that the **structure** is **utilized**.



pCPS 9.1.1 Dictionary in python

- The **location** that an element is stored in and retrieved from within an associative data structure **depends** only on its **key** value , thus there is **no** logical **first** element, **second** element, and so on.

- The **specific location** that a value is stored is determined by a particular method of converting **key values** into **index values** called **hashing**

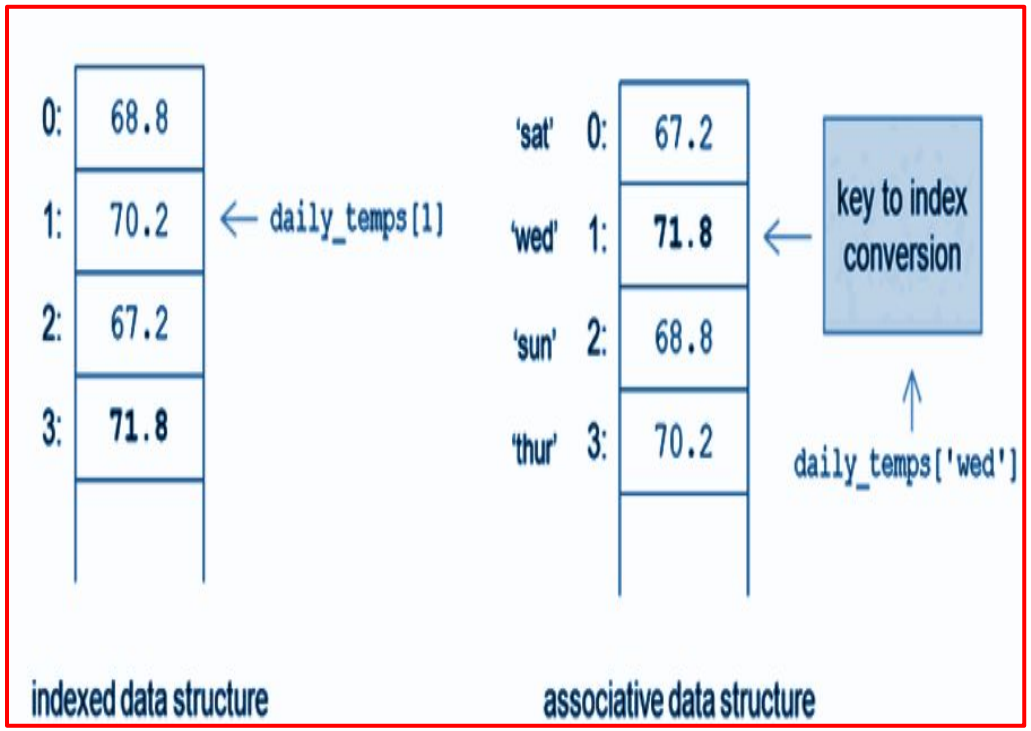


pCPS 9.1.1 Hashable in python

- An **object** is **hashable** if it has a **hash value** which **never changes** during its **lifetime**

- **Hashability** makes an object **usable** as a **dictionary key** and a **set member**, because these data structures **use** the **hash value internally**

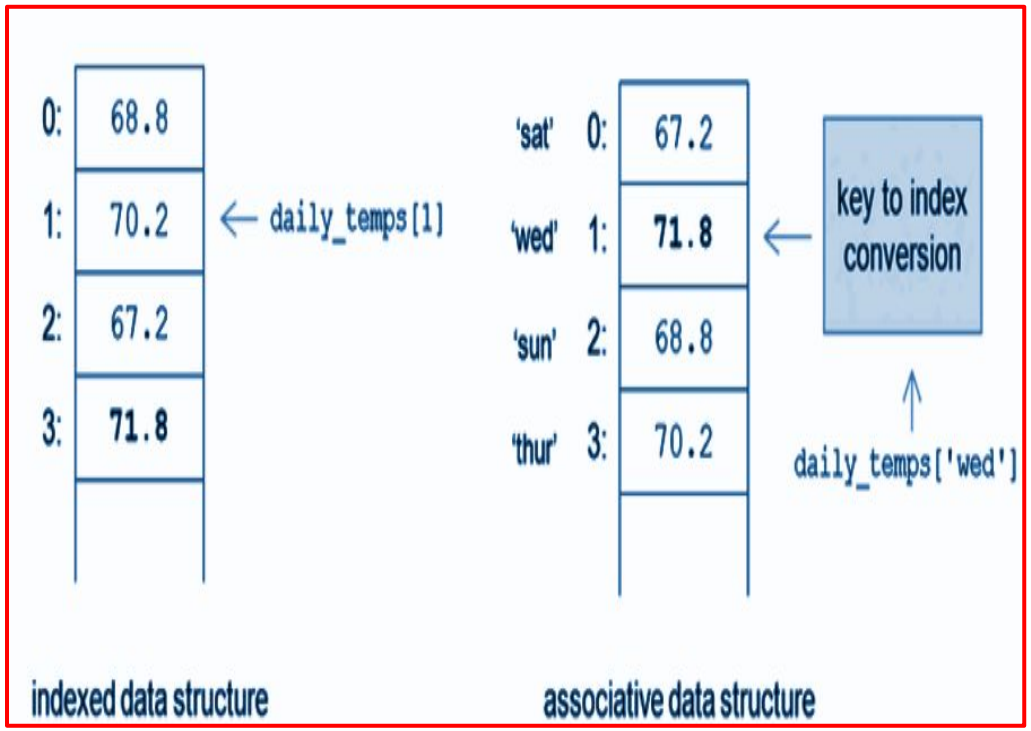
- All of python's **immutable built-in** objects are **hashable**, while **mutable containers** (such as lists or dictionaries) are **not hashable** .



pCPS 9.1.1 Hashable in python

- **Objects** which are **instances** of **user-defined classes** are **hashable** by **default**; they all compare unequal, and their hash value is their id()

- **Hashing** is a **concept** in computer science which is used to create high performance, **pseudo random** access data structures where **large** amount of **data** is to be **stored** and **accessed quickly**



pCPS 9.1.1 Operations on Dictionaries in python

Operation	Results
`dict()`	Creates a new, empty dictionary

`dict(s)`	Creates a new dictionary with key values and their associated values from sequence `s`, for example,
	`fruit_prices = dict(fruit_data)`
	where `fruit_data` is (possibly read from a file):
	`[['apples', .66],…,['bananas', .49]]`

`len(d)`	Length (num of key/value pairs) of dictionary `d`.
`d[key] = value`	Sets the associated value for `key` to `value`, used to either add a new key/value pair, or replace the value of an existing key/value pair.
`del d[key]`	Remove key and associated value from dictionary `d`.
`key in d`	`True` if key value `key` exists in dictionary `d`, otherwise returns `False`.

THANK YOU

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